

**Listing of the Claims:**

Claim 1 (Currently Amended): A morphological analyzer comprising:

a hypothesis generator for applying a prescribed method of morphological analysis to a text and generating one or more hypotheses as candidate results of the morphological analysis, each hypothesis being a word string with part-of-speech tags, the part-of-speech tags including form information for parts of speech having forms;

a model storage facility storing information for a plurality of part-of-speech n-gram models, at least one of the part-of-speech n-gram models including information about the forms of the parts of speech, at least two of the part-of-speech n-gram models being based on mutually different types of morphological information;

a probability calculator for finding a probability that each said hypothesis will appear in a large corpus of text by using a weighted combination of the information for the part-of-speech n-gram models stored in the model storage facility; and

a solution finder for finding a solution among said hypotheses, based on the probabilities generated by the probability calculator.

Claim 2 (Currently Amended): The morphological analyzer of claim 1, wherein said at least one of the part-of-speech n-gram models including information about forms of parts of speech is a hierarchical part-of-speech n-gram model that treats parts of speech and their forms at different hierarchical levels.

Claim 3 (Original): The morphological analyzer of claim 2, wherein the hierarchical part-of-speech n-gram model calculates a product of a conditional probability  $P(w_i|t_i)$  of

occurrence of a word  $w_i$  given its part of speech  $t_i$ , a conditional probability  $P(t_i^{\text{form}}|t_i^{\text{pos}})$  of occurrence of the part of speech  $t_i^{\text{pos}}$  of said word  $w_i$  in a form  $t_i^{\text{form}}$  shown by said word  $w_i$ , and a conditional probability  $P(t_i^{\text{pos}}|t_{i-N+1}...t_{i-1})$  of occurrence of the part of speech  $t_i^{\text{pos}}$  of said word  $w_i$  following a part-of-speech tag string  $t_{i-N+1}...t_{i-1}$  indicating parts of speech of  $N - 1$  preceding words, where  $N$  is a positive integer.

Claim 4 (Currently Amended): The morphological analyzer of claim 1, wherein at least one of the part-of-speech n-gram models is a lexicalized part-of-speech n-gram model in which all words are lexicalized.

Claim 5 (Original): The morphological analyzer of claim 4, wherein the lexicalized part-of-speech n-gram model calculates a product of a conditional probability  $P(w_i|t_i)$  of occurrence of a word  $w_i$  given its part of speech  $t_i$  and a conditional probability  $P(t_i|w_{i-N+1}t_{i-N+1}...w_{i-1}t_{i-1})$  of occurrence of the part of speech  $t_i$  of said word  $w_i$  following  $N - 1$  words  $w_{i-N+1}...w_{i-1}$  having respective parts of speech  $t_{i-N+1}...t_{i-1}$ , where  $N$  is a positive integer.

Claim 6 (Original): The morphological analyzer of claim 4, wherein the lexicalized part-of-speech n-gram model calculates a conditional probability  $P(w_it_i|t_{i-N+1}...t_{i-1})$  of occurrence of a word  $w_i$  having a part of speech  $t_i$  following a string of  $N - 1$  parts of speech  $t_{i-N+1}...t_{i-1}$ , where  $N$  is a positive integer.

Claim 7 (Original): The morphological analyzer of claim 4, wherein the lexicalized part-of-speech n-gram model calculates a conditional probability  $P(w_i t_i | w_{i-N+1} t_{i-N+1} \dots w_{i-1} t_{i-1})$  of occurrence of a word  $w_i$  having a part of speech  $t_i$  following a string of  $N - 1$  words  $w_{i-N+1} \dots w_{i-1}$  having respective parts of speech  $t_{i-N+1} \dots t_{i-1}$ , where  $N$  is a positive integer.

Claim 8 (Currently Amended): The morphological analyzer of claim 1, wherein at least one of the part-of-speech n-gram models stored in the model storage facility is a class part-of-speech n-gram model employing classes obtained by clustering.

Claim 9 (Original): The morphological analyzer of claim 8, wherein the class part-of-speech n-gram model calculates a product of a conditional probability  $P(w_i | t_i)$  of occurrence of a word  $w_i$  given its part of speech  $t_i$  and a conditional probability  $P(t_i | c_{i-N+1} t_{i-N+1} \dots c_{i-1} t_{i-1})$  of occurrence of said part of speech  $t_i$  following a string of  $N - 1$  words assigned to respective classes  $c_{i-N+1} \dots c_{i-1}$  with respective parts of speech  $t_{i-N+1} \dots t_{i-1}$ , where  $N$  is a positive integer.

Claim 10 (Original): The morphological analyzer of claim 8, wherein the class part-of-speech n-gram model calculates a product of a conditional probability  $P(w_i t_i | c_{i-N+1} t_{i-N+1} \dots c_{i-1} t_{i-1})$  of occurrence of a word  $w_i$  having a part of speech  $t_i$  following a string of  $N - 1$  words in respective classes  $c_{i-N+1} \dots c_{i-1}$  with respective parts of speech  $t_{i-N+1} \dots t_{i-1}$ , where  $N$  is a positive integer.

Claim 11 (Currently Amended): The morphological analyzer of claim 8, wherein the class part-of-speech n-gram model is trained from both a part-of-speech tagged corpus and a part-of-speech untagged corpus, clustering parameters obtained from the part-of-speech untagged corpus being used to cluster morphemes in the part-of-speech tagged corpus.

Claim 12 (Original): The morphological analyzer of claim 1, further comprising a weight calculation unit using a leave-one-out method to calculate weights of the part-of-speech n-gram models.

Claim 13 (Currently Amended): A method of morphological analysis comprising:  
applying a prescribed method of morphological analysis to a text and generating one or more hypotheses as candidate results of the morphological analysis, each hypothesis being a word string with part-of-speech tags, the part-of-speech tags including form information for parts of speech having forms;

calculating probabilities that each said hypothesis will appear in a large corpus of text by using a weighted combination of a plurality of part-of-speech n-gram models, at least one of the part-of-speech n-gram models including information about forms of parts of speech, at least two of the part-of-speech n-gram models being based on mutually different types of morphological information; and

finding a solution among said hypotheses, based on said probabilities.

Claim 14 (Currently Amended): The method of claim 13, wherein said at least one of the

part-of-speech n-gram models including information about forms of parts of speech is a hierarchical part-of-speech n-gram model that treats parts of speech and their forms at different hierarchical levels.

Claim 15 (Original): The method of claim 14, wherein the hierarchical part-of-speech n-gram model calculates a product of a conditional probability  $P(w_i|t_i)$  of occurrence of a word  $w_i$  given its part of speech  $t_i$ , a conditional probability  $P(t_i^{\text{form}}|t_i^{\text{pos}})$  of occurrence of the part of speech  $t_i^{\text{pos}}$  of said word  $w_i$  in a form  $t_i^{\text{form}}$  shown by said word  $w_i$ , and a conditional probability  $P(t_i^{\text{pos}}|t_{i-N+1}...t_{i-1})$  of occurrence of the part of speech  $t_i^{\text{pos}}$  of said word  $w_i$  following a part-of-speech tag string  $t_{i-N+1}...t_{i-1}$  indicating parts of speech of  $N - 1$  preceding words, where  $N$  is a positive integer.

Claim 16 (Currently Amended): The method of claim 13, wherein at least one of the part-of-speech n-gram models is a lexicalized part-of-speech n-gram model in which all words are lexicalized.

Claim 17 (Currently Amended): The method of claim 13, wherein at least one of the part-of-speech n-gram models is a class part-of-speech n-gram model employing classes obtained by clustering.

Claim 18 (Currently Amended): The method of claim 17, further comprising training the class part-of-speech n-gram model from both a part-of-speech tagged corpus and a part-of-speech untagged corpus, clustering parameters obtained from the part-of-speech

untagged corpus being used to cluster morphemes in the part-of-speech tagged corpus.

Claim 19 (Original): The method of claim 13, further comprising using a leave-one-out method to calculate weights of the part-of-speech n-gram models.

Claim 20 (Currently Amended): A machine-readable tangible medium storing a program comprising instructions that can be executed by a computing device to carry out morphological analysis by the method of claim 13.